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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/500,905	01/31/2005	Harry Richard Claringburn	P/62303	1397

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KIRSCHSTEIN, OTTINGER, ISRAEL
& SCHIFFMILLER, P.C.
489 FIFTH AVENUE
NEW YORK, NY 10017

EXAMINER

LIU, LI

ART UNIT	PAPER NUMBER
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2613

MAIL DATE	DELIVERY MODE
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09/20/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.		Applicant(s)	
	10/500,905		CLARINGBURN ET AL.	
	Examiner		Art Unit	
	Li Liu		2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 July 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/31/2005</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 1/31/2005 is being considered by the examiner.

Drawings

2. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.

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- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Examiner suggests that the section headings are inserted into the specification.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 9, 10, 12, 13 and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Caroli et al (US 2003/0002104).

1). With regard to claims 9, 12 and 13, the AAPA discloses a dense wavelength division multiplexing (DWDM) optical communications network having a plurality of nodes (Figure 1, the ADD/DROP nodes) for an n-channel dense wavelength division multiplexing (DWDM) optical network (Figure 1, N channels are added or dropped), each node comprising: an add path (e.g., 231 in Figure 2, or 431 in Figure 4) for adding an n-channel wavelength multiplex onto the network, some of the n-channels carrying signals to be added onto the network (e.g., Figures 2 and 4, N channels are added or dropped, [0017]), the add path including an n-channel signal combiner (the MUX 235 in Figure 2, or MUX 435, 436 and combiner 437 in Figure 4) for combining the n-channel signals, an optical amplifier (e.g., the amplifier 438 in Figure 4) for amplifying an output of the signal combiner, a multichannel wavelength selective filter (the λ -BLOCKER/DGEF 240 in Figure 2, or the λ -BLOCKER/DGEF 440 in Figure 2) with variable-per-channel attenuation (DGEF in the wavelength blockers) for blocking channels not carrying signals to be added to the network or controlling an amplitude of the added signals ([0028], [0031]-[0034], [0048]), and an add coupler for coupling the add path to the network (e.g., combiner 230 in Figure 2, or the combiner 430 in Figure 4).

2). With regard to claims 10 and 15, Caroli et al further discloses wherein the variable attenuator on any given channel is set to block the signal on that channel if no signal on that channel is to be added onto the network, or used to control the amplitude of the added signals ([0028] and [0031]-[0034]), and a variable optical attenuator arranged within the wavelength blockers (DGEF, [0028] and [0031]-[0034], [0048]).

In Figures 2 and 4, although Caroli et al does not expressly show "wherein the multichannel wavelength selective filter includes an n-channel demultiplexer having n outputs, an n-channel multiplexer having n inputs, and the variable optical attenuator is arranged between each of the demultiplexer outputs and multiplexer inputs", an n-channel demultiplexer and an n-channel multiplexer must be present in the wavelength blocker.

Caroli et al teaches that the λ -BLOCKER/DGEF wavelength blockers incorporate a dynamic gain equalization function (DGEF) to provide **per-channel** gain equalization so that all "through" and "add" channels are essentially at the same power level when outputted from the respective wavelength blockers ([0034]); and dynamically adjusting gain of the optical channels therefore can effectively compensate for the aforementioned power divergence that may occur in the optical channels and which worsens as optical channels traverse multiple repeater (e.g., amplifier) and other add/drop nodes. (also refer to [0048]). Therefore, it is inherent that an n-channel demultiplexer and an n-channel multiplexer must be present in the wavelength blocker and the DGEF must be arranged between each of the demultiplexer outputs and multiplexer inputs so that the multiplexed signal can be demultiplexed and the individual channel can be dynamically controlled (per-channel) by the DGEF.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 11, 14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Caroli et al (US 2003/0002104).

1). With regard to claims 11 and 14, Caroli et al disclose all of the subject matter as applied to claims 9 and 14 above. But, Caroli et al does not expressly state the optical network node comprising means for running sources for generating the n-channel signals at maximum power, or running the signal sources at full power to optimize an optical signal-to-noise ratio of the signals added to the network.

However, Caroli et al teaches a wavelength blocker with variable-per-channel attenuation (DGEF) for blocking channels not carrying signals to be added to the network or controlling an amplitude of the added signals. It is well known that while the sources for generating the n-channel signals are run at maximum power, the VOA or DGEF can be fully activated to attenuate the channel power to a desired level and block the noise ([0048]); otherwise, if the sources are run below a predetermined level, the VOA/DGEF would not participate in the controlling. Therefore, it is obvious to one skilled in the art to run the signal sources at maximum power so that the multichannel wavelength selective filter can be used to attenuate the signal and amplifier noise, and then the SNR of the added channel can be improved.

2). With regard to claim 16, Caroli et al disclose all of the subject matter as applied to claims 13 and 15 above. And Caroli et al further discloses wherein the non-

signal carrying channels are blocked by attenuating to zero the outputs from the demultiplexer corresponding to those channels ([0031]-[0032]).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 9-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant admitted prior art (AAPA: the "known add/drop node", Figure 1, and page 1 line 5 to page 3 line 12 of the Specification) in view of Sharratt et al (US 2001/0040710).

1). With regard to claims 9, 12 and 13, the AAPA discloses a dense wavelength division multiplexing (DWDM) optical communications network having a plurality of nodes (AAPA discloses that the FIG. 1 shows an example of how add/drop multiplexers are used. At network **nodes**, traffic is taken off the network and split into the component channels using an optical demultiplexer or a splitter and band pass filter and added into the network using an optical multiplexer and an add coupler. The network **nodes** can add or drop traffic to either of the network fibers. It is desirable to route traffic the shortest distance around the network which will depend on the location of the destination node. Therefore, the optical communications network has a plurality of nodes) for an n-channel dense wavelength division multiplexing (DWDM) optical network (AAPA: typically the traffic is a multiplex of 32 wavelength channels), each

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node comprising: an add path (the path from MUX 34 in Figure 1) for adding an n-channel wavelength multiplex onto the network, some of the n-channels carrying signals to be added onto the network (e.g., 32 wavelength channels are added), the add path including an n-channel signal combiner (the MUX 34 in Figure 1) for combining the n-channel signals, an optical amplifier (the amplifier 32 in Figure 1) for amplifying an output of the signal combiner, a tunable filter (36 in Figure 1), and an add coupler (e.g., the add coupler 28 in Figure 1) for coupling the add path to the network.

But, the AAPA does not expressly disclose that the tunable filter is a multichannel wavelength selective filter with variable-per-channel attenuation for blocking channels not carrying signals to be added to the network or controlling an amplitude of the added signals.

However, Sharratt et al discloses a multichannel wavelength selective filter (e.g., the CCU 270 and 290 in Figure 2, and 930 and 940 in Figure 5; and Figure 3) with variable-per-channel attenuation (820 in Figure 3) for blocking channels not carrying signals to be added to the network or controlling an amplitude of the added signals ([0082], [0084] and [101]).

As disclosed by the AAPA, for the conventional system such as Figure 1, "[t]he noise that is generated is dependant on the gain of the amplifier in the add path. This gain is determined by the maximum possible losses in the add path. When a signal is added, the source powers are adjusted on a per channel basis to achieve the required power at the point of addition. The signal to noise ratio is therefore worst when the loss of the add path is less than the maximum loss possible. The OSNR is optimised when

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the path loss is a maximum as the noise from the EDFA amplifier experiences the maximum loss”.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use channel control unit as taught by Sharratt et al to the system of the AAPA so that the power of the individual channel can be controlled after the amplifier and the noise (around the waveband of not added channel) from the amplifier can be removed, and then the signal SNR can be increased.

2). With regard to claims 10 and 15, the AAPA and Sharratt et al disclose all of the subject matter as applied to claims 9 and 13 above, and Sharratt et al further discloses wherein the multichannel wavelength selective filter includes an n-channel demultiplexer (800 in Figure 3) having n outputs, an n-channel multiplexer (810 in Figure 3) having n inputs, and a variable optical attenuator (820 in Figure 3) arranged between each of the demultiplexer outputs and multiplexer inputs, wherein the variable attenuator on any given channel is set to block the signal on that channel if no signal on that channel is to be added onto the network, or used to control the amplitude of the added signals ([0082], [0084] and [101]).

3). With regard to claims 11 and 14, the AAPA and Sharratt et al disclose all of the subject matter as applied to claims 9 and 13 above. But, the AAPA and Sharratt et al do not expressly state the optical network node comprising means for running sources for generating the n-channel signals at maximum power, or running the signal sources at full power to optimize an optical signal-to-noise ratio of the signals added to the network.

However, as disclosed by the AAPA, for the conventional system such as Figure 1, "[t]he noise that is generated is dependant on the gain of the amplifier in the add path. This gain is determined by the maximum possible losses in the add path. When a signal is added, the source powers are adjusted on a per channel basis to achieve the required power at the point of addition. The signal to noise ratio is therefore worst when the loss of the add path is less than the maximum loss possible. The OSNR is optimised when the path loss is a maximum as the noise from the EDFA amplifier experiences the maximum loss". And Sharratt et al teaches a multichannel wavelength selective filter with variable-per-channel attenuation for blocking channels not carrying signals to be added to the network or controlling an amplitude of the added signals. It is well known that while the sources for generating the n-channel signals are run at maximum power, the VOA or DGEF can be fully activated to attenuate the channel power to a desired level and block the noise ([0048]); otherwise, if the sources are run below a predetermined level, the VOA/DGEF would not participate in the controlling. Therefore, it is obvious to one skilled in the art to run the signal sources at maximum power so that the multichannel wavelength selective filter can be used to attenuate the signal and amplifier noise, and then the SNR of the added channel can be improved.

4). With regard to claim 16, the AAPA and Sharratt et al disclose all of the subject matter as applied to claims 13 and 15 above, and Sharratt et al further discloses wherein the non-signal carrying channels are blocked by attenuating to zero the outputs from the demultiplexer corresponding to those channels ([0101]).

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Monnard et al (US 6,633,430).

Lichtman et al (US 7,106,969).

Otsuka et al (US 6,538,782).

Fang et al (US 6,504,963).

DeGrange et al (US 2002/0105695).

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Li Liu whose telephone number is (571)270-1084. The examiner can normally be reached on Mon-Fri, 8:00 am - 5:30 pm, alternating Fri off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Vanderpuye can be reached on (571)272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Li Liu
September 9, 2007


KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER